US007793360B2

(12) **United States Patent**
Blauer et al.

(10) **Patent No.: US 7,793,360 B2**
(45) **Date of Patent: Sep. 14, 2010**

(54) **HIGH-VISIBILITY TURNOUT COAT ASSEMBLAGE**

(75) Inventors: **Stephen J Blauer**, Lexington, MA (US); **Thomas W Ames**, Brookline, MA (US)

(73) Assignee: **Blauer Manufacturing Company, Inc.**, Boston, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 187 days.

(21) Appl. No.: **12/128,702**

(22) Filed: **May 29, 2008**

(65) **Prior Publication Data**

US 2010/0186136 A1 Jul. 29, 2010

(51) **Int. Cl.**
A62B 17/00 (2006.01)

(52) **U.S. Cl.** **2/81**; 2/94; 2/95; 2/96; 2/97; 2/102; 2/462; 2/46; 2/48

(58) **Field of Classification Search** 2/81, 2/94, 95, 96, 97, 102, 462, 46, 48, 49.1
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,034,133	A *	5/1962	Eilenberg	2/97
4,320,538	A *	3/1982	Saft	2/102
4,754,500	A *	7/1988	Brucato et al.	2/105
5,110,655	A	5/1992	Engler et al.	
5,188,267	A	2/1993	Sargent et al.	
D440,716	S	4/2001	Lesley	
6,820,280	B1	11/2004	Atallah et al.	
6,892,394	B2	5/2005	Grilliot et al.	
6,978,481	B2 *	12/2005	Mordecai et al.	2/81

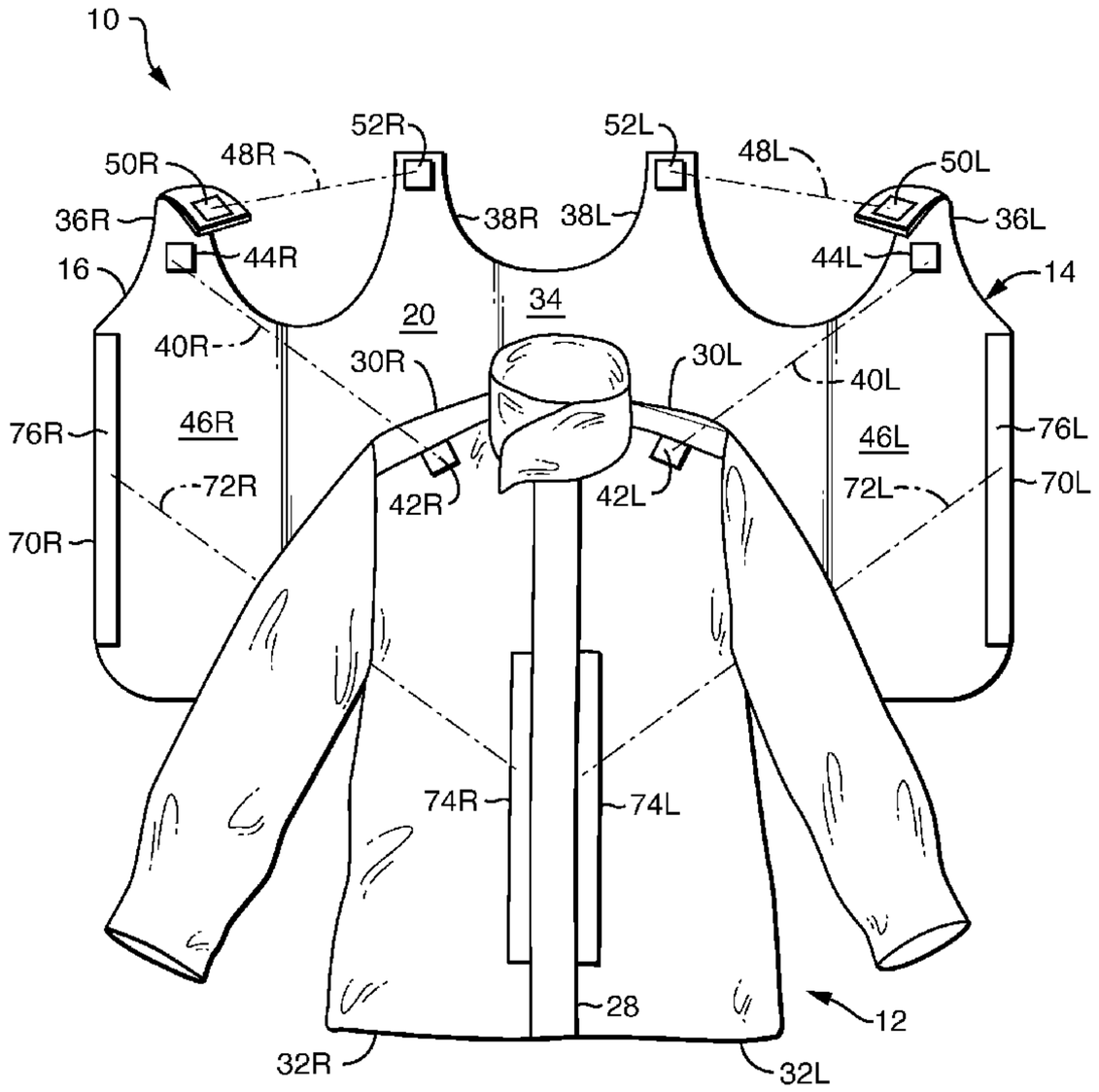
* cited by examiner

Primary Examiner—Gary L Welch
Assistant Examiner—Alissa J Tompkins
(74) *Attorney, Agent, or Firm*—Altman & Martin; Steven K. Martin

(57) **ABSTRACT**

A high-visibility covering is removably attached to a firefighter turnout coat at the shoulders and front closure by easily separable fasteners so that the assemblage can be donned as a single coat and the high-visibility covering can be easily ripped off. In one embodiment, the covering is a single panel that wraps around the coat, extending from the shoulders to the waist or hips. In another embodiment, the covering is composed of three panels, two front panels and a back panel. Front shoulder straps on the covering are removably attached to the front of the turnout coat at the shoulders. Back shoulder straps on the panel overlap and are removably attached to the corresponding front shoulder straps. In the three panel embodiment, the back panel has a pair of lappets that overlap and are removably attached to the corresponding front panel.

7 Claims, 5 Drawing Sheets



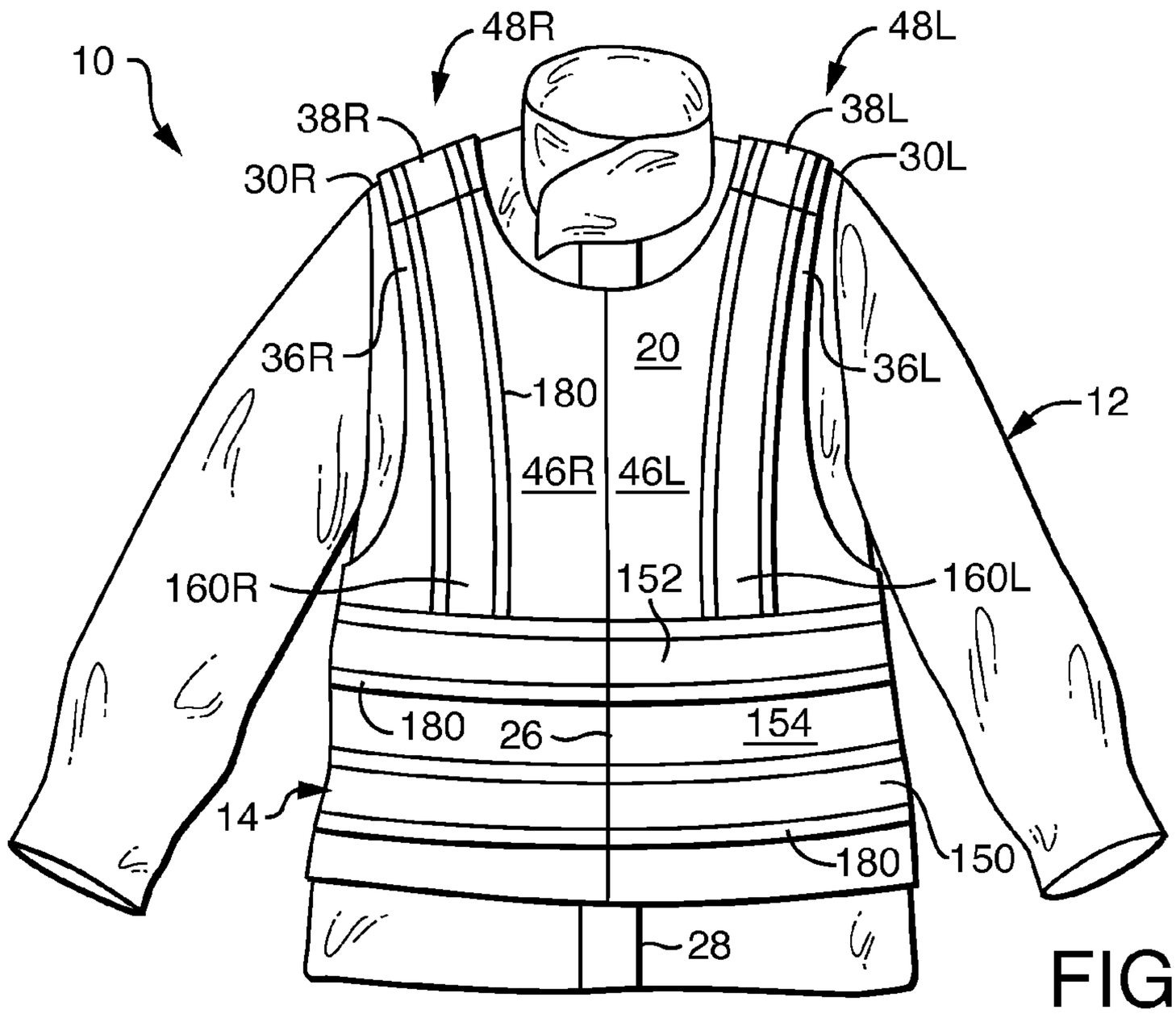

10
48R
48L
38R
38L
30R
30L
36R
36L
20
180
46R
46L
12
160R
152
160L
180
26
154
14
180
150
28

FIG. 1

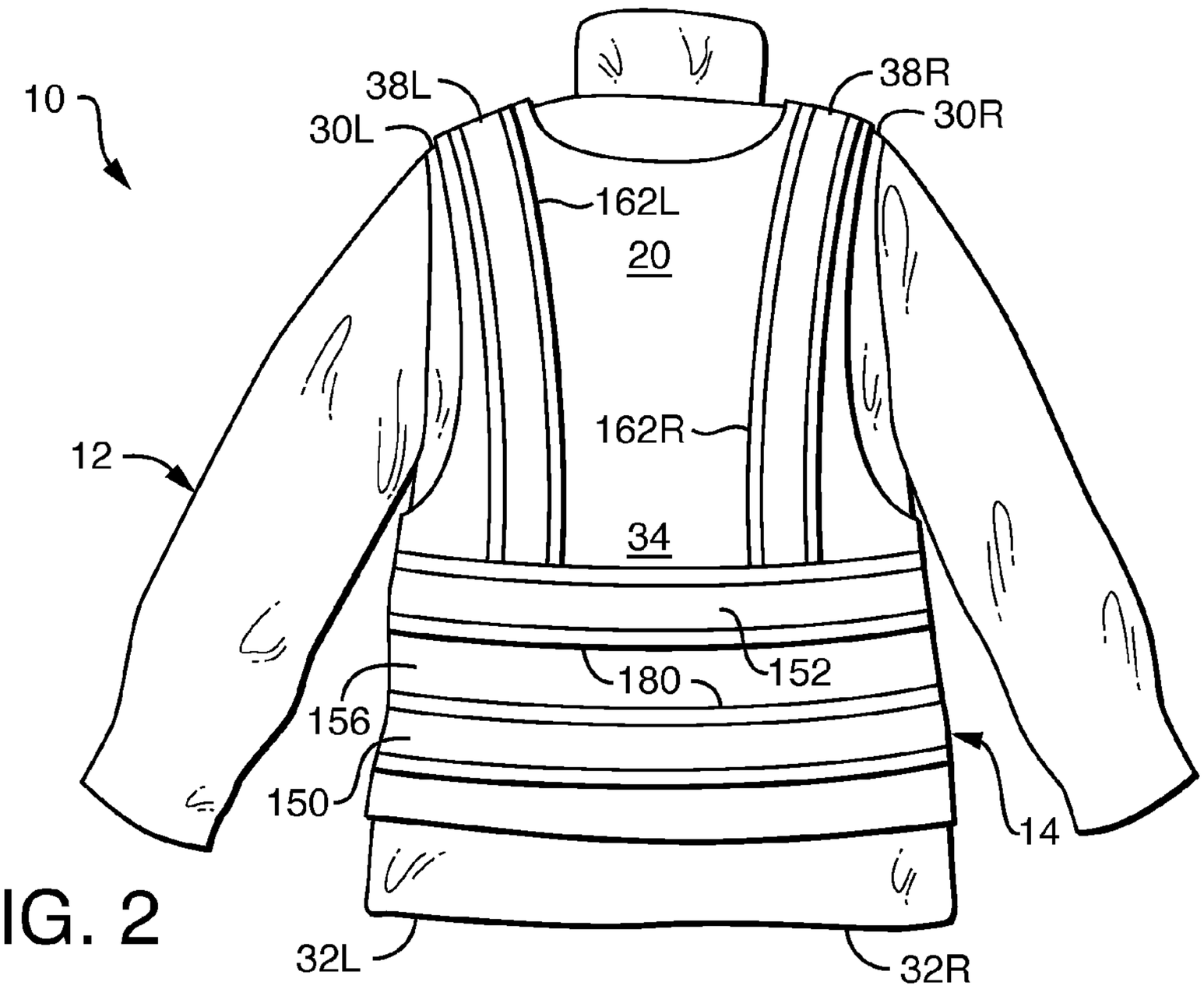

10
38L
38R
30L
30R
162L
20
12
162R
34
180
152
156
150
14
32L
32R

FIG. 2

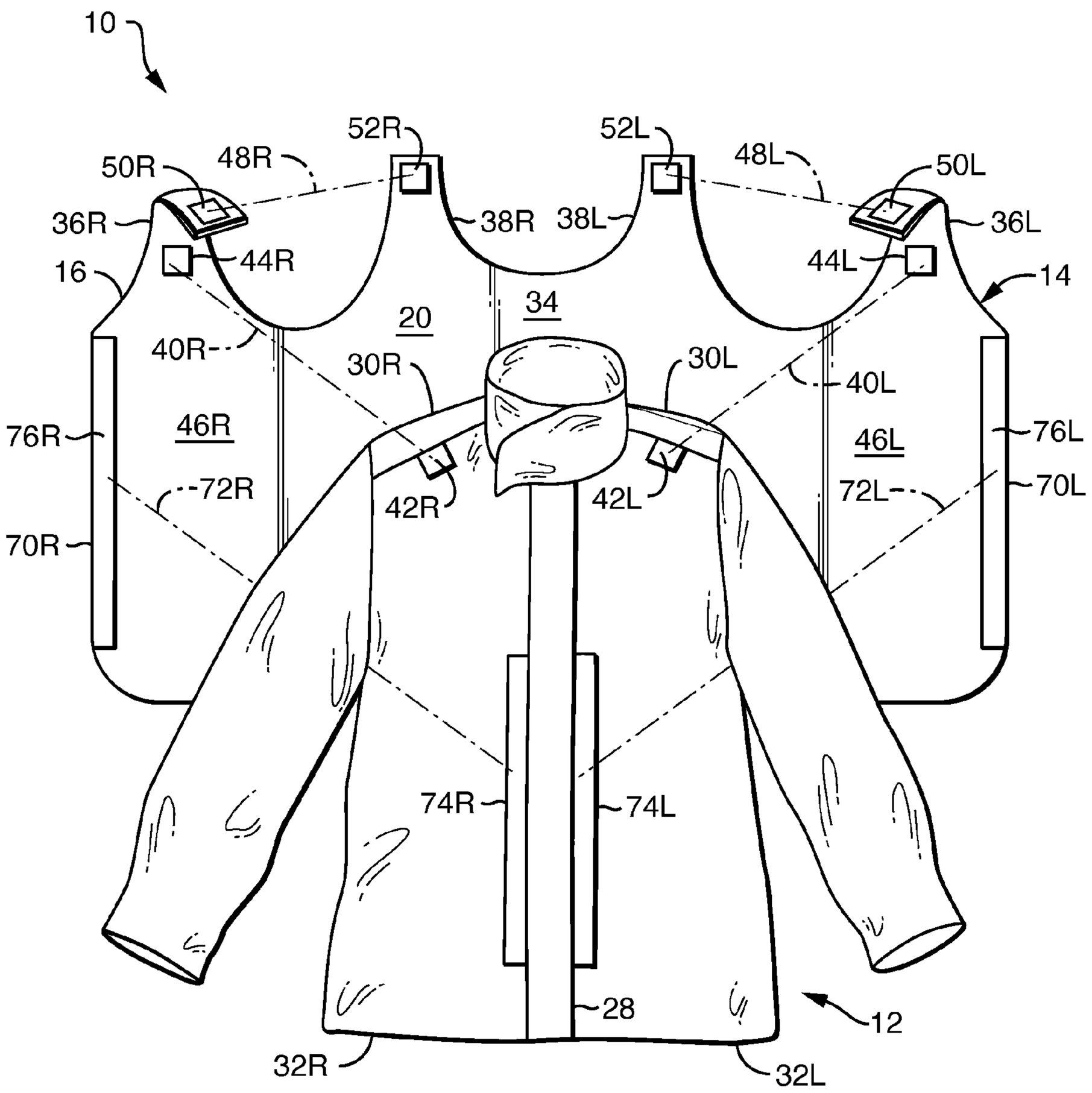

10
52R
52L
48R
48L
50R
50L
36R
36L
38R
38L
44R
44L
16
14
34
20
40R
40L
30R
30L
46R
46L
76R
76L
72R
72L
70R
70L
42R
42L
74R
74L
28
12
32R
32L

FIG. 3

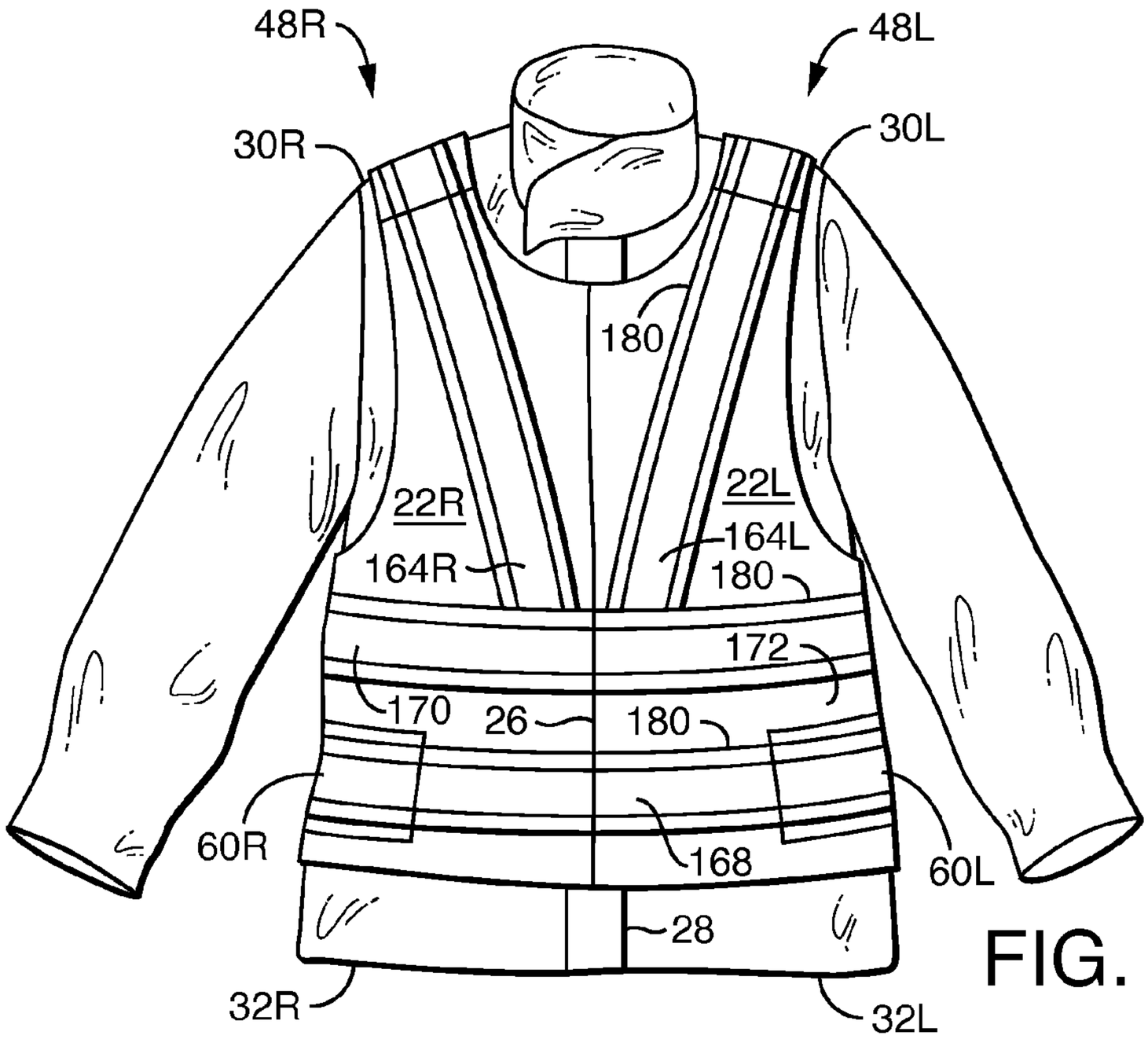

48R
48L
30R
30L
180
22R
22L
164R
164L
180
172
170
26
180
60R
168
60L
28
32R
32L

FIG. 4

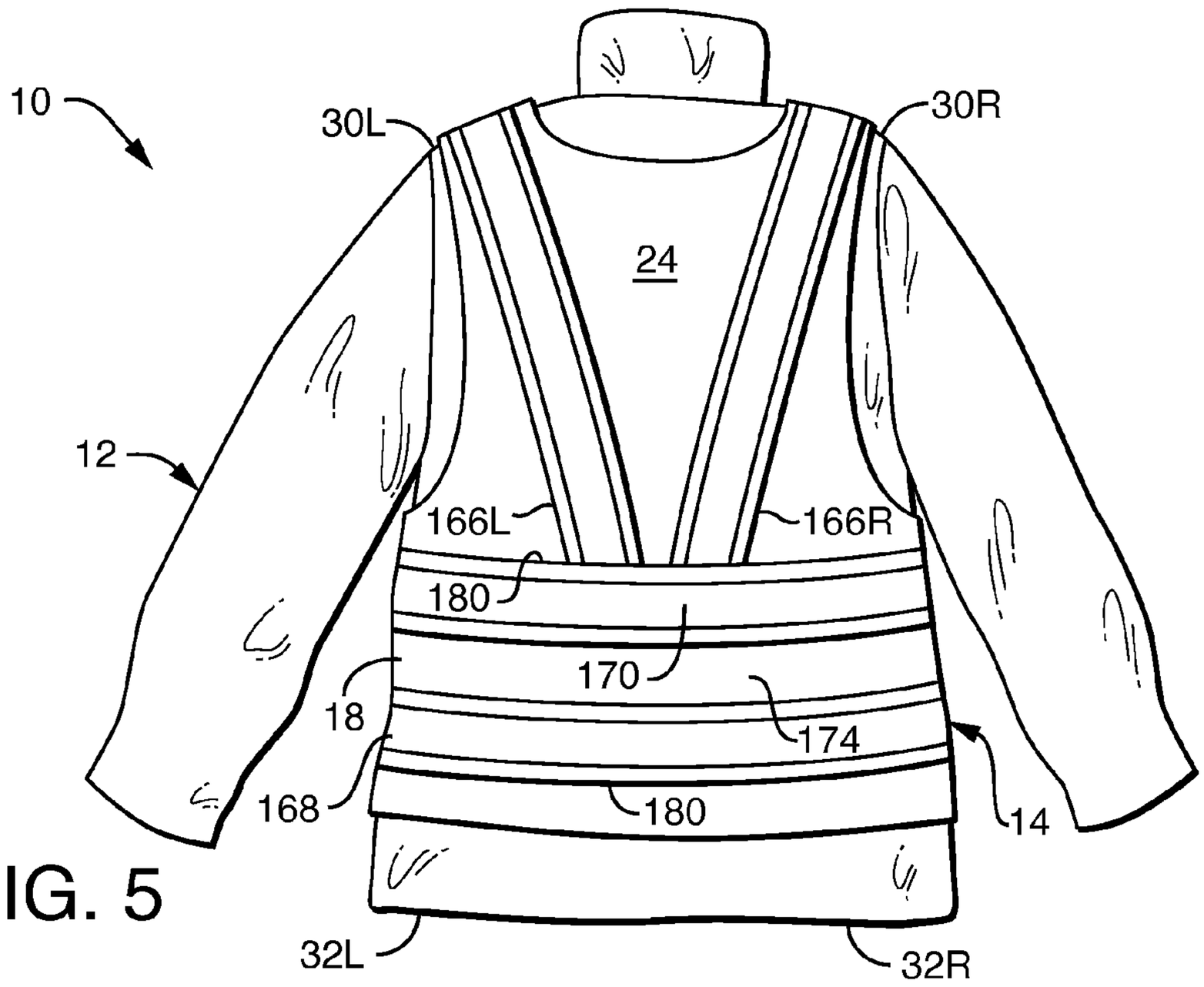

10
30L
30R
24
12
166L
166R
180
170
18
174
168
180
14
32L
32R

FIG. 5

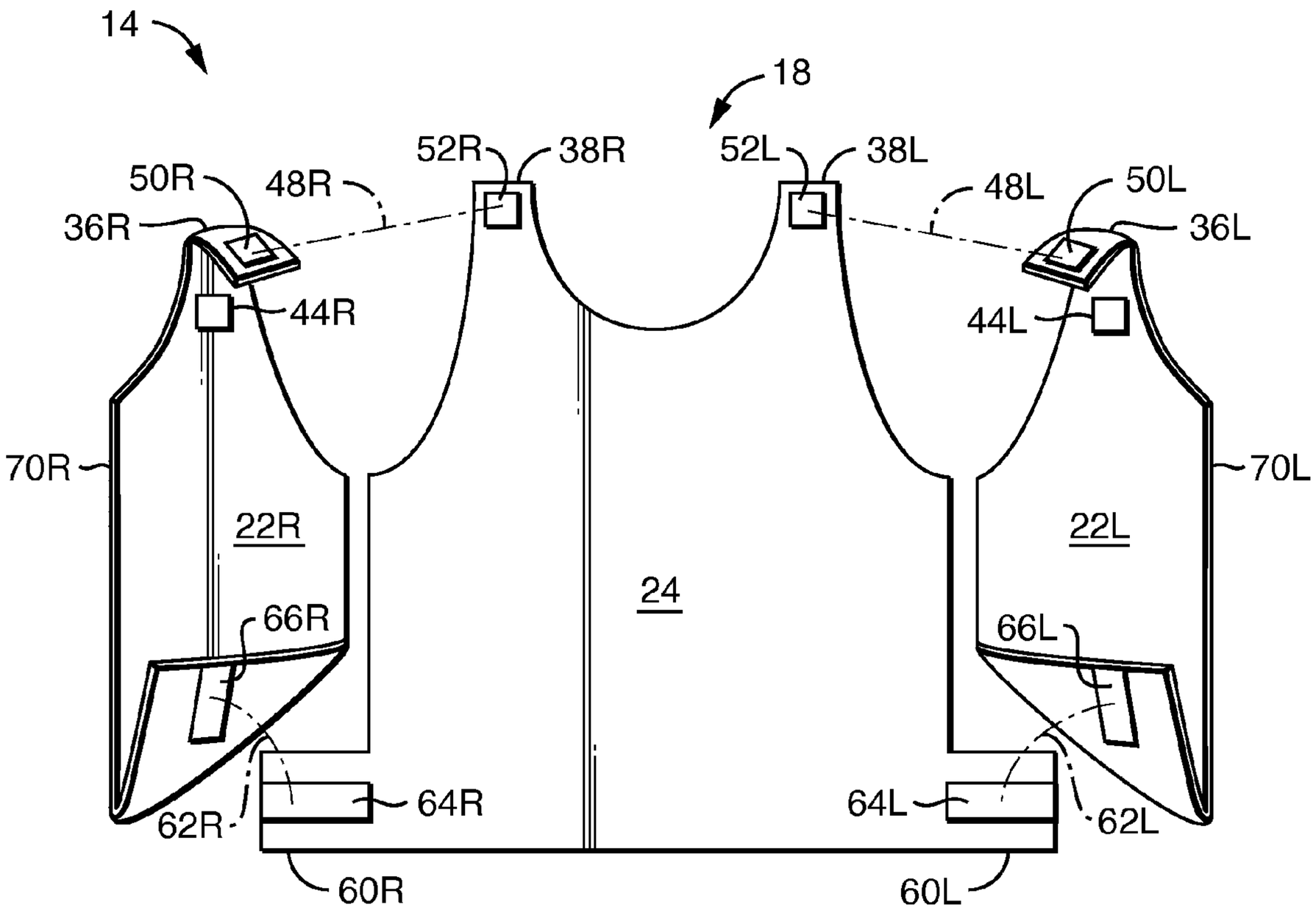

14
18
52R
38R
52L
38L
50R
48R
48L
50L
36R
36L
44R
44L
70R
70L
22R
22L
24
66R
66L
64R
64L
62R
62L
60R
60L

FIG. 6

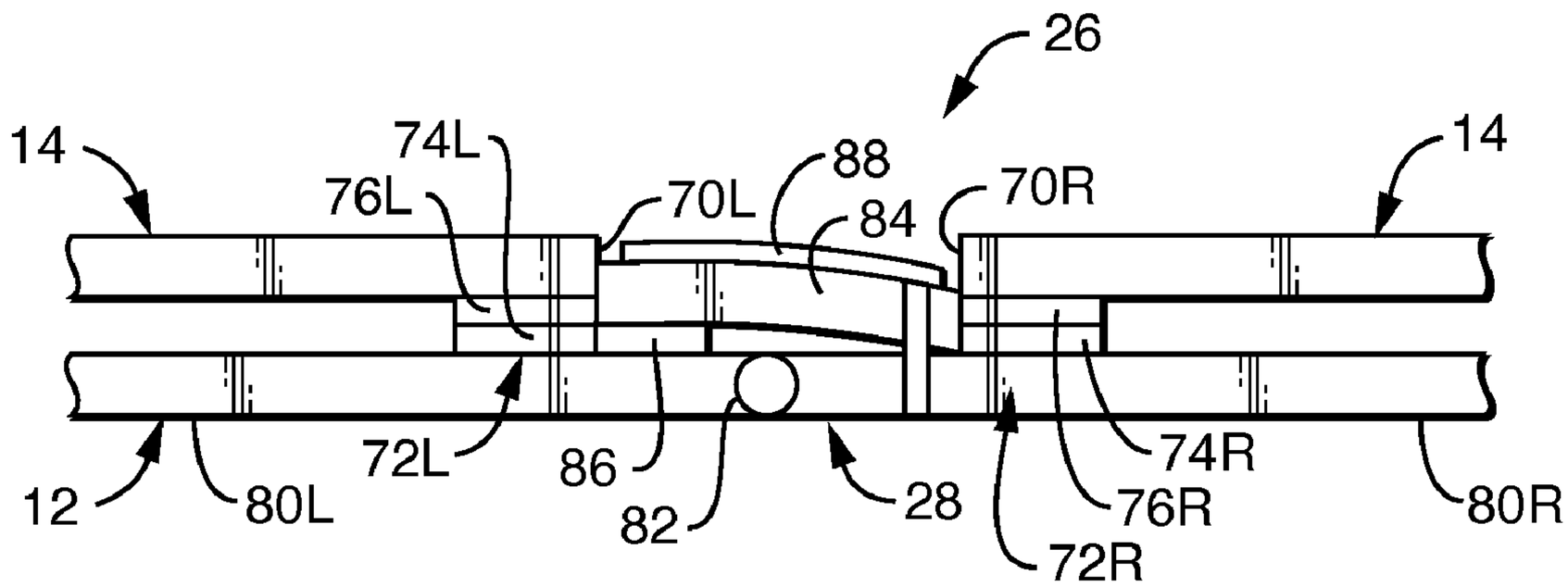


FIG. 7

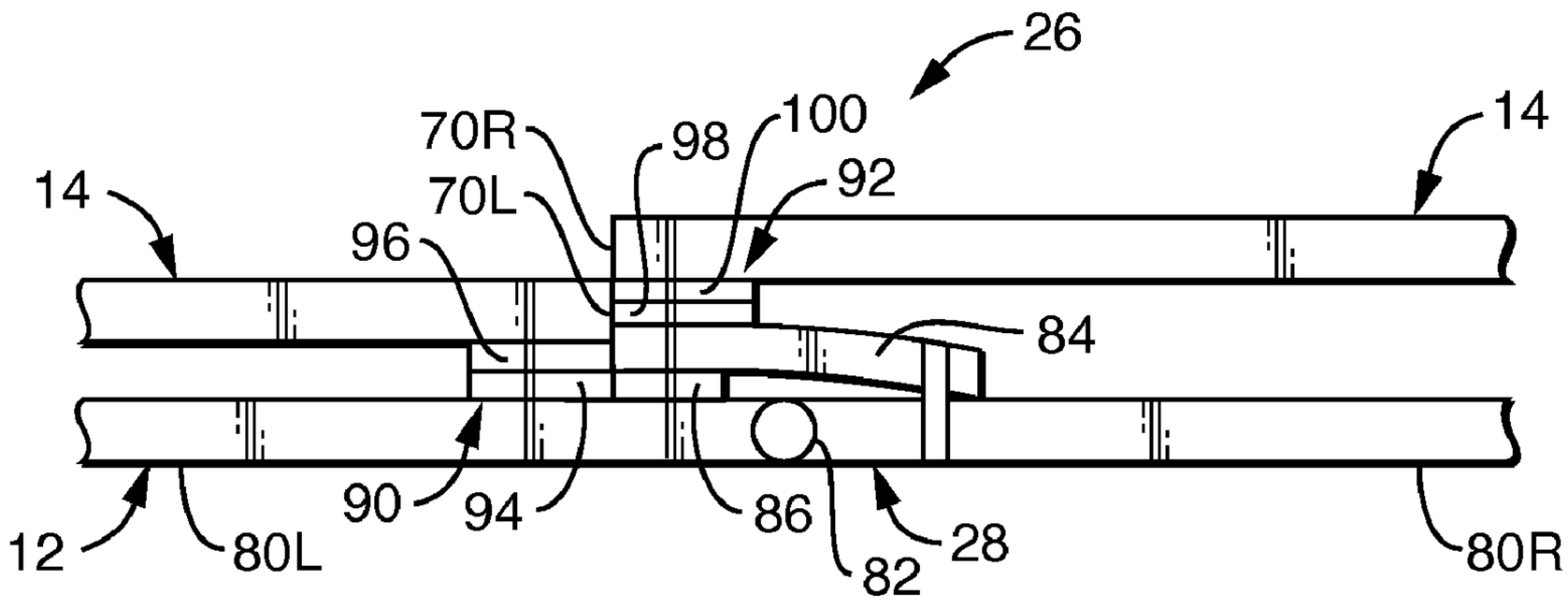


FIG. 8

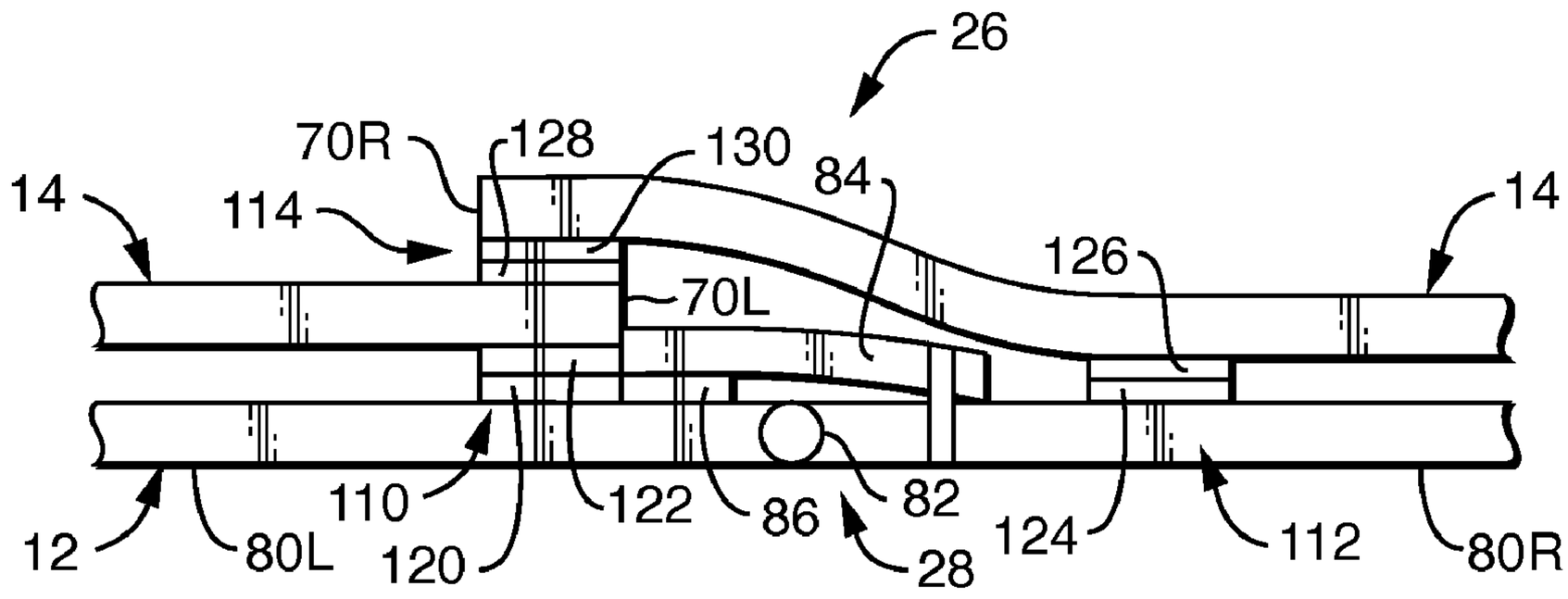


FIG. 9

HIGH-VISIBILITY TURNOUT COAT ASSEMBLAGE

CROSS-REFERENCES TO RELATED APPLICATIONS

Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO A SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to protective clothing, and, more particularly, to the high-visibility requirement of firefighter turnout coats.

2. Description of the Related Art

American National Standards Institute (ANSI) standard 107-2004 provides guidelines for high-visibility safety apparel to improve worker visibility during the day, in low-light conditions, and at night. In 2006, ANSI approved and published a new standard, ANSI 207-2006, for visibility requirements for safety vests worn by public safety personnel such as firefighters. The standard specifies minimum performance and design requirements for safety vests to insure appropriate visibility to moving vehicles while simultaneously minimizing interference with equipment worn by the person. The safety vests are to be worn only around traffic and, in accordance with National Fire Protection Association (NFPA) 1971-2000 (Standard on Protective Ensemble for Structural Firefighting) must be removed before approaching a fire. One way for firefighters to meet the visibility requirements is to wear a high-visibility vest over the turnout coat that can be easily removed prior to approaching a fire. One such vest is disclosed in U.S. Pat. No. 6,820,280, entitled RIP-OFF, HIGH-VISIBILITY, SAFETY VEST. The vest has hook and loop fasteners, such as VELCRO, at the waist or hips and shoulders so that the vest can be easily pulled away when necessary. The main drawback to this arrangement is that it employs another garment that must be donned after the turnout coat, taking extra time, a luxury that firefighters do not always have.

BRIEF SUMMARY OF THE INVENTION

An object of the present invention is to provide a clothing assemblage that permits firefighters to easily and conveniently meet both the visibility requirements of ANSI 207-2006 and the protection requirements of NFPA 1971-2000.

In the present invention, a high-visibility covering is removably attached to a firefighter turnout coat at the shoulders and front closure by easily separable fasteners. The assemblage is donned as a single coat and the high-visibility covering can be easily ripped off.

The covering has two embodiments. In the first, the covering is a single panel that wraps around the coat, extending from the shoulders to the waist or hips. In the second, the covering is composed of three panels: a right front panel, a left front panel, and a back panel. Front shoulder straps on the covering are removably attached to the front of the turnout coat at the shoulders by easily separable fasteners. Back shoulder straps on the panel overlap and are removably attached to the corresponding front shoulder straps by easily separable fasteners. In the three panel embodiment, the back panel has a pair of lappets that overlap and are removably attached to the corresponding front panel by easily separable fasteners.

The covering panel(s) is a polymeric fabric that is finished with a high chromaticity fluorescent dye in a highly luminescent color.

Several embodiments are contemplated for the covering closure. The coat closure has a fastener, typically a zipper, and a vertical flap the covers the fastener. In one embodiment, the front edges of the covering are removably attached to the front of the coat adjacent to the flap by easily separable fasteners. In another embodiment, one front edge of the covering is removably attached adjacent to the flap and the other front edge is removably attached to the flap. In a third embodiment, one front edge of the covering is removably attached adjacent to the flap and the other front edge overlaps the flap and is removably attached to the first front edge.

Retroreflective bands span the covering in any pattern that that meets the requirements of ANSI 207-2006. Optional trim at the edge of the bands provides a distinctive and sharp border.

Other objects of the present invention will become apparent in light of the following drawings and detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and object of the present invention, reference is made to the accompanying drawings, wherein:

FIG. **1** is a front view of the assemblage of the present invention with the single-panel embodiment of the covering;

FIG. **2** is a back view of the single-panel embodiment of FIG. **1**;

FIG. **3** is an exploded view of the single-panel embodiment of FIG. **1**;

FIG. **4** is a front view of the assemblage of the present invention with the three-panel embodiment of the covering;

FIG. **5** is a back view of the three-panel embodiment of FIG. **4**;

FIG. **6** is an exploded view of the three-panel embodiment of FIG. **4** without the turnout coat;

FIG. **7** is an exaggerated, top, cross-sectional view of one configuration of the center front of the assemblage;

FIG. **8** is an exaggerated, top, cross-sectional view of another configuration of the center front of the assemblage; and

FIG. **9** is an exaggerated, top, cross-sectional view of another configuration of the center front of the assemblage.

DETAILED DESCRIPTION OF THE INVENTION

The present invention incorporates a firefighter turnout coat **12** and a high-visibility covering **14** in an assemblage **10**. The covering **14** is removably attached to the turnout coat **12** by easily separably fasteners. The coat/covering assemblage is donned as a single coat, rather than as a coat and then a high-visibility vest, saving time. When the high-visibility covering is no longer needed, such as when approaching a fire, it can be easily ripped off.

The preferred fasteners are hook and loop fasteners, for example, those sold under the trade name VELCRO. Hook and loop fasteners come in two mating elements as fabric patches. The patches can be attached to the coat and panel fabric in whatever way is appropriate, and can include sewing and adhesives. Attachments to the turnout coat **12** cannot impair the protective requirements of the coat as mandated by NFPA 1971. Although hook and loop fasteners are preferred and are employed exclusively in the remainder of the present specification, the present invention contemplates the use of other easily separable fasteners, such as snaps, tacky patches, and magnetic patches.

A turnout coat **12** is the type of jacket worn by firefighters. According to the National Fire Protection Association (NFPA) 1971 (Standard on Protective Ensemble for Structural Firefighting), a turnout coat must be comprised of three components: an outer shell, a moisture barrier, and a thermal barrier, with pockets of air therebetween. The materials used for the three layers may vary but will very often include a NOMEX/KEVLAR combination of material.

The present invention envisions two embodiments of the covering **14**. In the first embodiment **16**, shown in FIGS. **1-3**, the covering **14** is composed of a single panel **20** with a right front portion **46**R, a left front portion **46**L, and a back portion **34**. The single panel **20** wraps around the coat **12**, extending from the shoulders **30**R, **30**L (collectively, **30**) to the waist or hips (referred to collectively as the hips in the remainder of the specification and claims **32**R, **32**L (collectively, **32**). The panel **20** attaches to the coat **12** at the shoulders **30** and at the front closure **28** of the coat **12**.

Preferably, the panel **20** is composed of tightly knit or woven strands of polyester or polypropylene, and are characterized by a denier ranging from 30 to 500 and a weight ranging from 2 to 6 ounces per square yard. This polymeric fabric is finished with a high chromaticity fluorescent dye in a highly luminescent color, such as yellow, green, orange or white, that collects light, which may be of relatively low luminosity, e.g. ambient light, and responds by emitting light of relatively high luminosity.

Front shoulder straps **36**R, **36**L (collectively, **36**) extend upwardly from the right front portion **46**R and left front portion **46**L, respectively, of the panel **20** and are removably attached to the front of the turnout coat **12** by easily separable fasteners **40**R, **40**L (collectively, **40**). One element **42**R, **42**L (collectively, **42**) of each fastener **40** is attached to the front of the coat **12** at the shoulders **30** and the other element **44**R, **44**L (collectively, **44**) of the fastener **40** is attached to the inside of the corresponding front shoulder strap **36**.

Back shoulder straps **38**R, **38**L (collectively, **38**) extending upwardly from the back portion **34**. Each back shoulder strap **38** overlaps the corresponding front shoulder strap **36** and is removably attached to the corresponding front shoulder strap **36** by an easily separable fastener **48**R, **48**L (collectively, **48**). One element **50**R, **50**L (collectively, **50**) of the fastener **48** is attached to the outside of the covering front shoulder strap **36** and the other element **52**R, **52**L (collectively, **52**) is attached to the inside of the covering back shoulder strap **38**.

For all attachments between the covering **14** and the coat **12**, in order to avoid problems with undesirable objects adhering to the turnout coat **12**, it is preferred that the fastener element **42** on the coat **12** be the loop component because of the hook component's tendency to adhere to most fuzzy surfaces that come into contact with it.

In a similar vein, it is desirable that both fasteners element **44**, **50** on the front shoulder strap **36** be same fastener component, be it the hook component or the loop component, so that when the covering **14** is removed, the fastener element **52** on back shoulder strap **38** will not inadvertently adhere to the fastener element **42** on the front of the coat **12**.

The second embodiment **18** of the covering **14**, shown in FIGS. **4-6**, is composed of three panels, a right front panel **22**R, a left front panel **22**L (collectively, **22**), and a back panel **24**. The right front panel **22**R extends from the right shoulder **30**R to the right hip **32**R, the left front panel **22**L extends from the left shoulder **30**L to the left hip **32**L, and the back panel **24** extends from the shoulders **30** to the hips **32**. The shoulder attachments **40** and the shoulder strap attachments **48** are the same as those of the single-panel embodiment **16**.

The back panel **24** has a pair of lappets **60**R, **60**L (collectively, **60**) that overlap with the front panels **22** and are removably attached together by easily separable fasteners **62**R, **62**L (collectively, **82**). One element **64**R, **64**L (collectively, **64**) of the fastener **62** is attached to the inside of the lappet **60** and the other element **66**R, **66**L (collectively, **66**) of the fastener **62** is attached to the outside of the corresponding front panel **22**.

FIGS. **3** and **6-9** show several embodiments of the covering closure **26** for both the single-panel embodiment **16** and the three-panel embodiment **18**. The covering closure **26** of FIGS. **3** and **7** can be used if the turnout coat closure **28** has a vertical retroreflective strip **88** and the covering closures **26** of FIGS. **8** and **9** can be used for all turnout coats **12**. The coat closure **28** has a fastener **82** to fasten the two sides **80**R, **80**L of the coat together. A vertical flap **84** goes over the fastener **82** and the flap **84** is held in place by a removable fastener **86** to provide additional protection.

In the closure **26** of FIGS. **3** and **7**, the front edges **70**R, **70**L (collectively, **70**) of the covering **14** are removably attached to the front of the coat **12** at the coat closure **28** adjacent to the flap **84** by two easily separable fasteners **72**R, **72**L (collectively, **72**). One element **74**R, **74**L (collectively, **74**) of the fastener **72** is attached to the front of the coat **12** adjacent to the flap **84** and the other element **76**R, **76**L (collectively, **76**) of the fastener **72** is attached to the inside of the covering front edge **70**.

In the closure **26** of FIG. **8**, the front edges **70** of the covering **14** are removably attached to the front of the coat **12** at the coat closure **28** by two easily separable fasteners **90**, **92**. One element **94** of fastener **90** is attached to the front of the coat **12** adjacent to the flap **84** and the other element **96** of fastener **90** is attached to the inside of the covering left front edge **70**L. One element **98** of fastener **92** is attached to the front of the coat **12** on top and at the edge of the flap **84** and the other element **100** of fastener **92** is attached to the inside of the covering right front edge **70**R. When the flap **84** is closed, the front edges **70** abut each other, giving the appearance of continuity.

In the closure **26** of FIG. **9**, the front edges **70** of the covering **14** are removably attached to the front of the coat **12** by three easily separable fasteners **110**, **112**, **114**. One element **120** of the fastener **110** is attached to the front of the coat **12** adjacent to the flap **84** and the other element **122** of the fastener **110** is attached to the inside of the covering left front edge **70**L. One element **124** of the fastener **112** is attached to the front of the coat **12** adjacent to the flap **84** and the other element **126** of the fastener **112** is attached to the inside of the covering spaced from the right front edge **70**R. One element **128** of the fastener **114** is attached to the outside of the covering left front edge **70**L and the other element **130** of the fastener **114** is attached to the inside of the covering right front edge **70**R. When the flap **84** and panel **20** are closed, the front edges **70** overlap each other, giving the appearance of continuity.

All embodiments of the covering fasteners **72**, **90**, **92**, **110**, **112**, **114** may extend continuously over the length of closure,

as in FIG. **3**, or some shorter length. Alternatively, the covering fasteners **72**, **90**, **92**, **110**, **112**, **114** may be composed of short patches of fastener elements along the length of the closure.

Retroreflective bands span the covering **14**. As is well known, retroreflective surfaces (i.e. distributions of minute corner reflectors or high refractive index glass beads) return specular light in the direction of its source, e.g. vehicle headlights at night. An example of a retroreflective band contemplated for use in the present invention is sold by 3M Company under the trade name SCOTCHLITE.

The present invention contemplates any pattern of retroreflective bands that are adequate to meet the requirements of ANSI 207-2006, which requires at least 201 square inches of retroreflective material. Two different patterns are shown in the figures.

As shown in FIGS. **1** and **2**, a lower horizontal retroreflective band **150** extends around the covering **14** near the bottom and when the covering closure **26** is closed, appear as a continuous band around the torso. An upper horizontal band **152** extends around the covering **14** near the center under the arms and when the covering closure **26** is closed, appear as a continuous band around the torso. The horizontal bands **150**, **152** define regions **154**, **156** therebetween for the optional presentation of alphanumeric or other graphic indicia.

A pair of vertical retroreflective bands **160**R, **160**L extend upwardly from the upper band **152** in the front to the shoulders **30** and a pair of vertical retroreflective bands **162**R, **162**L extend upwardly from the upper band **152** in the back to the shoulders **30**. The vertical bands **160**R, **160**L, **162**R, **162**L overlap with the shoulder strap attachments **40** to form bands that appear continuous around the shoulders **30**.

Another pattern is shown in FIGS. **4** and **5**. A lower horizontal retroreflective band **168** extends around the covering **14** near the bottom and when the covering closure **26** and the lappets **60** are closed, appear as a continuous band around the torso. An upper horizontal band **170** extends around the covering **14** near the center under the arms and when the covering closure **26** is closed, appear as a continuous band around the torso. The horizontal bands **168**, **170** define regions **172**, **174** therebetween for the optional presentation of alphanumeric or other graphic indicia.

A pair of slanted vertical retroreflective bands **164**R, **164**L extend upwardly and outwardly from the center of the upper band **170** in the front to the shoulders **30** and a pair of vertical retroreflective bands **166**R, **166**L extend upwardly and outwardly from the center of the upper band **152** in the back to the shoulders **30**. The vertical bands **164**R, **164**L, **166**R, **166**L overlap with the shoulder strap attachments **40** to form bands that appear continuous around the shoulders **30**.

The covering **14**, when normally viewed, is generally of a highly luminescent color. The retroreflective bands, when normally viewed, are generally dull gray. Optional trim **180** at the edge of the bands provides a distinctive and sharp border.

Thus it has been shown and described a high-visibility turnout coat assemblage which satisfies the objects set forth above.

Since certain changes may be made in the present disclosure without departing from the scope of the present invention, it is intended that all matter described in the foregoing specification and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A high-visibility turnout coat assemblage comprising:

(a) a turnout coat having a front closure, a right shoulder having a right easily separable fastener, and a left shoulder having a left easily separable fastener;

(b) a covering extending around said coat and from shoulders to hips, said covering having a right front portion, a left front portion, and a back portion, said covering being composed of a luminescent material;

(c) said right front portion being removably attached to said turnout coat at said right shoulder by said right easily separable fastener;

(d) said left front portion being removably attached to said turnout coat at said left shoulder by said left easily separable fastener;

(e) said back portion having a right strap removably attached to said right front portion by an easily separable fastener and a left strap removably attached to said left front portion by an easily separable fastener;

(f) said right front portion and said left front portion being removably attached to said turnout coat at said front closure by easily separable fasteners; and

(g) retroreflective bands spanning said covering.

2. The assemblage of claim **1** wherein said easily separable fasteners are hook and loop fasteners.

3. The assemblage of claim **1** wherein said covering is comprised of a single panel.

4. The assemblage of claim **1** wherein said covering is comprised of a right front panel, left front panel, and back panel, said right front panel being removably attached to said back panel at said right hip by an easily separable fastener, and said left front panel being removably attached to said back panel at said left hip by an easily separable fastener.

5. The assemblage of claim **4** wherein said easily separable fasteners are hook and loop fasteners.

6. The assemblage of claim **1** wherein said front closure has a flap, and said right front portion and said left front portion are removably attached to said turnout coat adjacent to said flap.

7. The assemblage of claim **1** wherein said front closure has a flap with an edge, and one of said front portions is removably attached to said turnout coat adjacent to said flap and the other of said front portions is removably attached to said turnout coat at said flap edge.

* * * * *